

SEQUENCE LISTING

<110> INSERM

<120> A vaccine composition comprising an immunoadjuvant compound consisting of a Rho GTPase family activator

<130> Q971EP

<160> 9

<170> PatentIn version 3.1

<210> 1

<211> 1014

<212> PRT

<213> Escherichia coli

<400> 1

Met Gly Asn Gln Trp Gln Gln Lys Tyr Leu Leu Glu Tyr Asn Glu Leu
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Val Ser Asn Phe Pro Ser Pro Glu Arg Val Val Ser Asp Tyr Ile Lys
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Asn Cys Phe Lys Thr Asp Leu Pro Trp Phe Ser Arg Ile Asp Pro Asp
35 40 45

Asn Ala Tyr Phe Ile Cys Phe Ser Gln Asn Arg Ser Asn Ser Arg Ser
50 55 60

Tyr Thr Gly Trp Asp His Leu Gly Lys Tyr Lys Thr Glu Val Leu Thr
65 70 75 80

Leu Thr Gln Ala Ala Leu Ile Asn Ile Gly Tyr Arg Phe Asp Val Phe
85 90 95

Asp Asp Ala Asn Ser Ser Thr Gly Ile Tyr Lys Thr Lys Ser Ala Asp
100 105 110

Val Phe Asn Glu Glu Asn Glu Glu Lys Met Leu Pro Ser Glu Tyr Leu
115 120 125

His Phe Leu Gln Lys Cys Asp Phe Ala Gly Val Tyr Gly Lys Thr Leu
130 135 140

Ser Asp Tyr Trp Ser Lys Tyr Tyr Asp Lys Phe Lys Leu Leu Leu Lys
145 150 155 160

Asn Tyr Tyr Ile Ser Ser Ala Leu Tyr Leu Tyr Lys Asn Gly Glu Leu

165

170

175

Asp Glu Arg Glu Tyr Asn Phe Ser Met Asn Ala Leu Asn Arg Ser Asp
180 185 190

Asn Ile Ser Leu Leu Phe Phe Asp Ile Tyr Gly Tyr Tyr Ala Ser Asp
195 200 205

Ile Phe Val Ala Lys Asn Asn Asp Lys Val Met Leu Phe Ile Pro Gly
210 215 220

Ala Lys Lys Pro Phe Leu Phe Lys Lys Asn Ile Ala Asp Leu Arg Leu
225 230 235 240

Thr Leu Lys Glu Leu Ile Lys Asp Ser Asp Lys Gln Gln Leu Leu Ser
245 250 255

Gln His Phe Ser Leu Tyr Ser Arg Gln Asp Gly Val Ser Tyr Ala Gly
260 265 270

Val Asn Ser Val Leu His Ala Ile Glu Asn Asp Gly Asn Phe Asn Glu
275 280 285

Ser Tyr Phe Leu Tyr Ser Asn Lys Thr Leu Ser Asn Lys Asp Val Phe
290 295 300

Asp Ala Ile Ala Ile Ser Val Lys Lys Arg Ser Phe Ser Asp Gly Asp
305 310 315 320

Ile Val Ile Lys Ser Asn Ser Glu Ala Gln Arg Asp Tyr Ala Leu Thr
325 330 335

Ile Leu Gln Thr Ile Leu Ser Met Thr Pro Ile Phe Asp Ile Val Val
340 345 350

Pro Glu Val Ser Val Pro Leu Gly Leu Gly Ile Ile Thr Ser Ser Met
355 360 365

Gly Ile Ser Phe Asp Gln Leu Ile Asn Gly Asp Thr Tyr Glu Glu Arg
370 375 380

Arg Ser Ala Ile Pro Gly Leu Ala Thr Asn Ala Val Leu Leu Gly Leu
385 390 395 400

Ser Phe Ala Ile Pro Leu Leu Ile Ser Lys Ala Gly Ile Asn Gln Glu
405 410 415

Val Leu Ser Ser Val Ile Asn Asn Glu Gly Arg Thr Leu Asn Glu Thr
420 425 430

Asn Ile Asp Ile Phe Leu Lys Glu Tyr Gly Ile Ala Glu Asp Ser Ile
435 440 445

Ser Ser Thr Asn Leu Leu Asp Val Lys Leu Lys Ser Ser Gly Gln His
450 455 460

Val Asn Ile Val Lys Leu Ser Asp Glu Asp Asn Gln Ile Val Ala Val
465 470 475 480

Lys Gly Ser Ser Leu Ser Gly Ile Tyr Tyr Glu Val Asp Ile Glu Thr
485 490 495

Gly Tyr Glu Ile Leu Ser Arg Arg Ile Tyr Arg Thr Glu Tyr Asn Asn
500 505 510

Glu Ile Leu Trp Thr Arg Gly Gly Leu Lys Gly Gly Gln Pro Phe
515 520 525

Asp Phe Glu Ser Leu Asn Ile Pro Val Phe Phe Lys Asp Glu Pro Tyr
530 535 540

Ser Ala Val Thr Gly Ser Pro Leu Ser Phe Ile Asn Asp Asp Ser Ser
545 550 555 560

Leu Leu Tyr Pro Asp Thr Asn Pro Lys Leu Pro Gln Pro Thr Ser Glu
565 570 575

Met Asp Ile Val Asn Tyr Val Lys Gly Ser Gly Ser Phe Gly Asp Arg
580 585 590

Phe Val Thr Leu Met Arg Gly Ala Thr Glu Glu Ala Trp Asn Ile
595 600 605

Ala Ser Tyr His Thr Ala Gly Gly Ser Thr Glu Glu Leu His Glu Ile
610 615 620

Leu Leu Gly Gln Gly Pro Gln Ser Ser Leu Gly Phe Thr Glu Tyr Thr
625 630 635 640

Ser Asn Val Asn Ser Ala Asp Ala Ala Ser Arg Arg His Phe Leu Val
645 650 655

Val Ile Lys Val His Val Lys Tyr Ile Thr Asn Asn Asn Val Ser Tyr
660 665 670

Val Asn His Trp Ala Ile Pro Asp Glu Ala Pro Val Glu Val Leu Ala
675 680 685

Val Val Asp Arg Arg Phe Asn Phe Pro Glu Pro Ser Thr Pro Pro Asp
690 695 700

Ile Ser Thr Ile Arg Lys Leu Leu Ser Leu Arg Tyr Phe Lys Glu Ser
705 710 715 720

Ile Glu Ser Thr Ser Lys Ser Asn Phe Gln Lys Leu Ser Arg Gly Asn
725 730 735

Ile Asp Val Leu Lys Gly Arg Gly Ser Ile Ser Ser Thr Arg Gln Arg
740 745 750

Ala Ile Tyr Pro Tyr Phe Glu Ala Ala Asn Ala Asp Glu Gln Gln Pro
755 760 765

Leu Phe Phe Tyr Ile Lys Lys Asp Arg Phe Asp Asn His Gly Tyr Asp
770 775 780

Gln Tyr Phe Tyr Asp Asn Thr Val Gly Leu Asn Gly Ile Pro Thr Leu
785 790 795 800

Asn Thr Tyr Thr Gly Glu Ile Pro Ser Asp Ser Ser Ser Leu Gly Ser
805 810 815

Thr Tyr Trp Lys Lys Tyr Asn Leu Thr Asn Glu Thr Ser Ile Ile Arg
820 825 830

Val Ser Asn Ser Ala Arg Gly Ala Asn Gly Ile Lys Ile Ala Leu Glu
835 840 845

Glu Val Gln Glu Gly Lys Pro Val Ile Ile Thr Ser Gly Asn Leu Ser
850 855 860

Gly Cys Thr Thr Ile Val Ala Arg Lys Glu Gly Tyr Ile Tyr Lys Val
865 870 875 880

His Thr Gly Thr Thr Lys Ser Leu Ala Gly Phe Thr Ser Thr Thr Gly
885 890 895

Val Lys Lys Ala Val Glu Val Leu Glu Leu Leu Thr Lys Glu Pro Ile
900 905 910

Pro Arg Val Glu Gly Ile Met Ser Asn Asp Phe Leu Val Asp Tyr Leu
915 920 925

Ser Glu Asn Phe Glu Asp Ser Leu Ile Thr Tyr Ser Ser Ser Glu Lys
930 935 940

Lys Pro Asp Ser Gln Ile Thr Ile Ile Arg Asp Asn Val Ser Val Phe
945 950 955 960

Pro Tyr Phe Leu Asp Asn Ile Pro Glu His Gly Phe Gly Thr Ser Ala
965 970 975

Thr Val Leu Val Arg Val Asp Gly Asn Val Val Val Arg Ser Leu Ser
980 985 990

Glu Ser Tyr Ser Leu Asn Ala Asp Ala Ser Glu Ile Ser Val Leu Lys
995 1000 1005

Val Phe Ser Lys Lys Phe
1010

<210> 2
<211> 1014
<212> PRT
<213> Escherichia coli

<400> 2

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20 25 30

Arg Cys Phe Lys Thr Asp Leu Pro Trp Phe Ser Gln Val Asp Pro Asp
35 40 45

Asn Thr Tyr Phe Ile Arg Phe Ser Gln Ser Arg Ser Asn Ser Arg Ser
50 55 60

Tyr Thr Gly Trp Asp His Leu Gly Lys Tyr Lys Thr Gly Val Leu Thr
65 70 75 80

Leu Thr Gln Ala Ala Leu Ile Asn Ile Gly Tyr His Phe Asp Val Phe
85 90 95

Asp Asp Ala Asn Ala Ser Ala Gly Ile Tyr Lys Thr Ser Ser Ala Asp
100 105 110

Met Phe Asn Glu Lys Asn Glu Glu Lys Met Leu Pro Ser Glu Tyr Leu
115 120 125

Tyr Phe Leu Lys Gly Cys Asp Phe Ser Gly Ile Tyr Gly Arg Phe Leu
130 135 140

Ser Asp Tyr Trp Ser Lys Tyr Asp Lys Phe Lys Leu Leu Leu Lys
145 150 155 160

Asn Tyr Tyr Ile Ser Ser Ala Leu Tyr Leu Tyr Lys Asn Gly Glu Ile
165 170 175

Asp Glu Tyr Glu Tyr Asn Phe Ser Ile Ser Ala Leu Asn Arg Arg Asp
180 185 190

Asn Ile Ser Leu Phe Phe Asp Ile Tyr Gly Tyr Ser Ser Asp
195 200 205

Met Phe Val Ala Lys Asn Asn Glu Arg Val Met Leu Phe Ile Pro Gly
210 215 220

Ala Lys Lys Pro Phe Leu Phe Glu Lys Asn Ile Ala Asp Leu Arg Ile
225 230 235 240

Ser Leu Lys Asn Leu Ile Lys Glu Asn Asp Asn Lys Gln Leu Leu Ser
245 250 255

Gln His Phe Ser Leu Tyr Ser Arg Gln Asp Gly Ile Thr Tyr Ala Gly
260 265 270

Val Asn Ser Val Leu Asn Ala Ile Glu Asn Asp Gly Val Phe Asn Glu
275 280 285

Ser Tyr Phe Leu Tyr Ser Asn Lys Arg Ile Asn Asn Lys Asp Val Phe
290 295 300

Asp Ala Val Ala Phe Ser Val Lys Lys Arg Ser Phe Ser Asp Gly Asp
305 310 315 320

Ile Val Ile Lys Ser Asn Ser Glu Ala Gln Arg Asp Tyr Ala Leu Thr
325 330 335

Ile Leu Gln Thr Ile Leu Ser Met Thr Pro Ile Phe Asp Val Ala Ile
340 345 350

Pro Glu Val Ser Val Thr Leu Gly Leu Gly Ile Ala Ser Ser Met
355 360 365

Gly Ile Ser Phe Asp Gln Leu Ile Asn Gly Asp Thr Tyr Glu Glu Arg
370 375 380

Arg Ser Ala Ile Pro Gly Leu Ala Thr Asn Ala Ala Leu Leu Gly Leu
385 390 395 400

Ser Phe Ala Ile Pro Phe Leu Ile Ser Lys Ala Gly Thr Asn Gln Lys
405 410 415

Ile Leu Ser Arg Tyr Thr Lys His Glu Ile Arg Thr Leu Asn Glu Thr
420 425 430

Asn Ile Asp Met Phe Leu Glu Tyr Gly Ile Asn Lys Asn Ser Ile
435 440 445

Ser Glu Thr Lys Val Leu Glu Val Glu Leu Lys Gly Ser Gly Gln His
450 455 460

Val Asn Ile Val Lys Leu Ser Asp Glu Asp Asn Lys Ile Val Ala Val
465 470 475 480

Lys Gly Asn Ser Leu Ser Gly Ile Tyr Tyr Glu Val Asp Ile Glu Thr
485 490 495

Gly Tyr Glu Ile Ser Ser Arg Arg Ile Tyr Arg Thr Glu Tyr Asn Asp
500 505 510

Lys Ile Phe Trp Thr Arg Gly Gly Leu Lys Gly Gly Gln Ser Phe
515 520 525

Asp Phe Glu Ser Leu Lys Leu Pro Ile Phe Phe Lys Asp Glu Pro Tyr
530 535 540

Ser Ala Val Pro Gly Ser Ser Leu Ser Phe Ile Asn Asp Asp Ser Ser
545 550 555 560

Leu Leu Tyr Pro Asn Ser Thr Pro Lys Leu Pro Gln Pro Thr Pro Glu
565 570 575

Met Glu Ile Val Asn Tyr Val Lys Arg Ala Gly Asn Phe Gly Glu Arg
580 585 590

Leu Val Thr Leu Met Arg Gly Thr Thr Glu Glu Ala Trp Asn Ile
595 600 605

Ala Arg Tyr His Thr Ala Gly Gly Ser Thr Glu Glu Leu His Glu Ile
610 615 620

Leu Leu Gly Gln Gly Pro Gln Ser Ser Leu Gly Phe Thr Glu Tyr Thr
625 630 635 640

Ser Asn Ile Asn Ser Ala Asp Ala Ala Ser Arg Arg His Phe Leu Val
645 650 655

Val Ile Lys Val Gln Val Lys Tyr Ile Asn Asn Asn Asn Val Ser His
660 665 670

Val Asn His Trp Ala Ile Pro Asp Glu Ala Pro Val Glu Val Leu Ala
675 680 685

Val Val Asp Arg Arg Phe Asn Phe Pro Glu Pro Ser Thr Pro Pro Asn
690 695 700

Ile Ser Ile Ile His Lys Leu Leu Ser Leu Arg Tyr Phe Lys Glu Asn
705 710 715 720

Ile Glu Ser Thr Ser Arg Leu Asn Leu Gln Lys Leu Asn Arg Gly Asn
725 730 735

Ile Asp Ile Phe Lys Gly Arg Gly Ser Ile Ser Ser Thr Arg Gln Arg
740 745 750

Ala Ile Tyr Pro Tyr Phe Glu Ser Ala Asn Ala Asp Glu Gln Gln Pro
755 760 765

Val Phe Phe Tyr Ile Lys Lys Asn Arg Phe Asp Asp Phe Gly Tyr Asp
770 775 780

Gln Tyr Phe Tyr Asn Ser Thr Val Gly Leu Asn Gly Ile Pro Thr Leu
785 790 795 800

Asn Thr Tyr Thr Gly Glu Ile Leu Ser Asp Ala Ser Ser Leu Gly Ser
805 810 815

Thr Tyr Trp Lys Lys Tyr Asn Leu Thr Asn Glu Thr Ser Ile Ile Arg

820

825

830

Val Ser Asn Ser Ala Arg Gly Ala Asn Gly Ile Lys Ile Ala Leu Glu
835 840 845

Glu Val Gln Glu Gly Lys Pro Val Ile Ile Thr Ser Gly Asn Leu Ser
850 855 860

Gly Cys Thr Thr Ile Val Ala Arg Lys Gly Gly Tyr Leu Tyr Lys Val
865 870 875 880

His Thr Gly Thr Thr Ile Pro Leu Ala Gly Phe Thr Ser Thr Thr Gly
885 890 895

Val Lys Lys Ala Val Glu Val Phe Glu Leu Leu Thr Asn Asn Pro Met
900 905 910

Pro Arg Val Glu Gly Val Met Asn Asn Asp Phe Leu Val Asn Tyr Leu
915 920 925

Ala Glu Ser Phe Asp Glu Ser Leu Ile Thr Tyr Ser Ser Ser Glu Gln
930 935 940

Lys Ile Gly Ser Lys Ile Thr Ile Ser Arg Asp Asn Val Ser Thr Phe
945 950 955 960

Pro Tyr Phe Leu Asp Asn Ile Pro Glu Lys Gly Phe Gly Thr Ser Val
965 970 975

Thr Ile Leu Val Arg Val Asp Gly Asn Val Ile Val Lys Ser Leu Ser
980 985 990

Glu Ser Tyr Ser Leu Asn Val Glu Asn Ser Asn Ile Ser Val Leu His
995 1000 1005

Val Phe Ser Lys Asp Phe
1010

<210> 3
<211> 1014
<212> PRT
<213> Yersinia pseudotuberculosis

<400> 3

Met Lys Asn Gln Trp Gln His Gln Tyr Phe Leu Ser Tyr Ser Glu Leu
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Val Ala Asn Phe Pro Ser Pro Glu Lys Val Val Ser Asp Tyr Ile Lys
20 25 30

His Lys Phe Ser Thr Thr Leu Pro Trp Phe Gly Trp Ala Asp Pro Asp
35 40 45

Asn Leu Tyr Phe Ile Arg Phe Thr Gln Ser Arg Ser Asn Asn Lys Ser
50 55 60

Tyr Thr Gly Trp Asp His Leu Gly Lys Tyr Ala Ile Glu Thr Leu Thr
65 70 75 80

Leu Thr Gln Ala Ala Ile Val Asn Ile Gly Ser Arg Phe Asp Ile Phe
85 90 95

Asp Glu Ala Asn Ser Thr Ala Gly Ile Tyr Lys Thr Asn Asn Ala Asp
100 105 110

Ser Phe Asp Glu Thr Asn Glu Ala Lys Met Leu Pro Ser Glu Tyr Leu
115 120 125

Tyr Phe Leu Arg Asp Cys Asp Phe Ser Asn Leu Tyr Asn Lys Ala Leu
130 135 140

Ser Asp Tyr Trp Ala Glu Asn Tyr Glu Lys Phe Ser Thr Leu Leu Gln
145 150 155 160

Asn Tyr Tyr Ile Ser Ser Ala Tyr Tyr Leu Tyr Lys Asp Ser Ala Ile
165 170 175

Ser Lys Asp Glu Tyr Glu Phe Ser Ile Asp Ala Ile Phe Asn Lys Lys
180 185 190

Ser Lys Ile Leu Arg Tyr Tyr Phe Asp Val Tyr Gly Tyr Tyr Ser Ser
195 200 205

Asp Met Phe Val Ala Met Asn Asp Asn Lys Thr Met Leu Phe Ile Pro
210 215 220

Gly Ala Thr Asn Pro Phe Ile Phe Ala Asp Asn Ile Thr Asp Leu Arg
225 230 235 240

Asp Lys Ile Lys Ala Leu Ile Ser Asp Lys Asn Thr Arg Glu Leu Phe
245 250 255

Ser Lys His Phe Ser Leu Tyr Asp Arg Gln Asp Gly Asn Thr Tyr Leu
260 265 270

Gly Val Asn Ser Met Leu Glu Gln Ile Val Ser Gly Val Val Asp Thr
275 280 285

Asn Tyr Ile Met Tyr Ser Asn Lys Asn Ile Arg Glu Arg Asn Val Phe
290 295 300

Gly Ser Met Ala Phe Ser Thr Arg Glu Arg Ser Phe Asn Asp Gly Asp
305 310 315 320

Val Ile Ile Lys Ser Asn Ala Glu Val Gln Arg Asp Tyr Ala Leu Asn
325 330 335

Val Leu Gln Thr Ile Leu Ser Leu Ser Pro Ile Phe Asp Ile Val Leu
340 345 350

Pro Glu Val Ser Ile Pro Ile Ser Leu Gly Ile Thr Ala Ser Ser Val
355 360 365

Gly Ile Ser Phe Asp Glu Leu Ile Asn Gly Asp Thr Tyr Glu Glu Arg
370 375 380

Arg Ser Ala Ile Pro Gly Leu Ala Thr Asn Thr Val Leu Leu Gly Ile
385 390 395 400

Ser Phe Ala Ile Pro Phe Leu Ile Ser Lys Ala Glu Glu Asn Lys Leu
405 410 415

Ile Ile Asn Asn Leu Val Gly Ser Asp Glu Asn Ile Leu Asn Lys Asn
420 425 430

Asn Leu Gly Asp Phe Leu Glu Lys Tyr Asn Ile Ser Glu Ser Asp Ile
435 440 445

Pro Glu Asn Gly Ser Leu Val Ile Asn Leu Lys Asn Thr Asn Val Pro
450 455 460

Val Arg Leu Val Lys Leu Asn Asp Glu Glu Gly Glu Ile Val Ala Ile
465 470 475 480

Lys Gly Ser Thr Leu Ser Gly Ile Tyr Tyr Glu Val Asp Thr Glu Thr
485 490 495

Gly Tyr Glu Ile Leu Ser Arg Arg Val Phe Arg Thr Glu Tyr Asn Glu

500

505

510

Lys Ile Tyr Trp Thr Arg Gly Gly Gly Leu Lys Gly Gly Gln Pro Phe
515 520 525

Asn Phe Glu Gly Leu Asp Ile Pro Val Tyr Phe Ile Asp Lys Pro Tyr
530 535 540

Ser Glu Leu Ala Ser Ser Val Glu Leu Ser Phe Val Asn Asp Asp Ser
545 550 555 560

Pro Leu Leu Phe Pro Glu Met Asp Ser Arg Leu Pro Lys Pro Thr Pro
565 570 575

Glu Leu Asp Ile Lys Tyr Tyr Ser Ser Asn Leu Ser Ser Phe Lys Glu
580 585 590

Asp Thr Val Ile Leu Met Arg Gly Thr Thr Glu Glu Glu Ala Trp Asn
595 600 605

Ile Ala Asn Tyr Lys Thr Ala Gly Gly Ser Asn Lys Asp Leu Glu Glu
610 615 620

Asn Phe Ile Glu Ala Gly Pro Gln Phe Asn Leu Ser Phe Ser Glu Tyr
625 630 635 640

Thr Ser Ser Ile Asn Ser Ala Asp Thr Ala Ser Arg Lys His Phe Leu
645 650 655

Val Ile Ile Lys Val Gln Val Lys Tyr Ile Ser Asn Asp Asn Val Leu
660 665 670

Tyr Ala Asn His Trp Ala Ile Pro Asp Glu Ala Pro Val Glu Val Leu
675 680 685

Ala Val Val Asp Arg Arg Phe Ile Phe Pro Glu Pro Pro Val Lys Pro
690 695 700

Lys Leu Ser Phe Ile Gln Lys Ile Ala Asn Arg Phe Leu Thr Glu Asn
705 710 715 720

Val Ala Glu Ile Ser Ser Ile Asn Phe Arg Arg Leu Asn Ser Gly Asn
725 730 735

Ile Asn Val Leu Lys Gly Arg Gly Val Phe Ser Ser Arg Arg Leu Arg
740 745 750

Glu Ile Tyr Leu Arg Phe Asp Ala Ala Asn Ala Asp Glu Leu Arg Pro
755 760 765

Gly Asp Val Tyr Val Lys Lys Thr Lys Phe Asp Ser Met Gly Tyr Asp
770 775 780

Ser His Phe Tyr Asn Glu Gly Ile Gly Ile Asn Gly Ala Pro Thr Leu
785 790 795 800

Asn Thr Tyr Thr Gly Glu Tyr Val Ala Asp Ser Ser Ser Gln Gly Ala
805 810 815

Thr Tyr Trp Leu Lys Tyr Asn Leu Thr Asn Glu Thr Ser Ile Ile Lys
820 825 830

Val Ser Asn Ser Ala Arg Gly Ala Asn Gly Ile Lys Ile Ala Leu Glu
835 840 845

Glu Ile Glu Glu Asn Lys Pro Val Val Ile Thr Ser Gly Thr Leu Thr
850 855 860

Gly Cys Thr Val Val Phe Ala Arg Lys Gly Glu Tyr Phe Tyr Ala Val
865 870 875 880

His Thr Gly Asn Ser Glu Ser Leu Ile Gly Phe Thr Ser Thr Ser Gly
885 890 895

Val Ala Lys Ala Ile Glu Val Leu Ser Ser Leu Ser Glu Leu Glu Val
900 905 910

Pro Ala Leu Pro Asp Val Ile Asn Asn Asn Thr Leu Val Glu Tyr Leu
915 920 925

Ser Asp Asn Phe Asp Ser Ala Leu Ile Ser Tyr Ser Ser Ser Ser Leu
930 935 940

Lys Pro Asn Ser Met Ile Asn Ile Ser Arg Glu Asn Val Ser Thr Phe
945 950 955 960

Ser Tyr Tyr Thr Asp Asp Ile Gln Leu Pro Ser Phe Gly Thr Ser Val
965 970 975

Thr Ile Leu Val Arg Thr Asn Asp Asn Thr Val Val Arg Ser Leu Ser
980 985 990

Glu Ser Tyr Thr Met Asn Ser Asn Ser Ser Lys Met Val Val Phe Asn
995 1000 1005

Val Leu Gln Lys Asp Phe
1010

<210> 4
<211> 1451
<212> PRT
<213> *Bordetella pertussis*

<400> 4

Met Ala Leu Val Gly Tyr Asp Gly Val Val Glu Glu Leu Leu Ala Leu
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Pro Ser Glu Glu Ser Gly Asp Leu Ala Gly Gly Arg Ala Lys Arg Glu
20 25 30

Lys Ala Glu Phe Ala Leu Phe Ser Glu Ala Pro Asn Gly Asp Glu Pro
35 40 45

Ile Gly Gln Asp Ala Arg Thr Trp Phe Tyr Phe Pro Lys Tyr Arg Pro
50 55 60

Val Ala Val Ser Asn Leu Lys Lys Met Gln Val Ala Ile Arg Ala Arg
65 70 75 80

Leu Glu Pro Glu Ser Leu Ile Leu Gln Trp Leu Ile Ala Leu Asp Val
85 90 95

Tyr Leu Gly Val Leu Ile Ala Ala Leu Ser Arg Thr Val Ile Ser Asp
100 105 110

Leu Val Phe Glu Tyr Val Lys Ala Arg Tyr Glu Ile Tyr Tyr Leu Leu
115 120 125

Asn Arg Val Pro His Pro Leu Ala Thr Ala Tyr Leu Lys Arg Arg Arg
130 135 140

Gln Arg Pro Val Asp Arg Ser Gly Arg Leu Gly Ser Val Phe Glu His
145 150 155 160

Pro Leu Trp Phe Ala Tyr Asp Glu Leu Ala Gly Thr Val Asp Leu Asp
165 170 175

Ala Asp Ile Tyr Glu Gln Ala Leu Ala Glu Ser Ile Glu Arg Arg Met

180

185

190

Asp Gly Glu Pro Asp Asp Gly Ser Leu Asp Thr Ala Glu His Asp Val
195 200 205

Trp Arg Leu Cys Arg Asp Gly Ile Asn Arg Gly Glu Gln Ala Ile Phe
210 215 220

Gln Ala Ser Gly Pro Tyr Gly Val Val Ala Asp Ala Gly Tyr Met Arg
225 230 235 240

Thr Val Ala Asp Leu Ala Tyr Ala Asp Ala Leu Ala Asp Cys Leu His
245 250 255

Ala Gln Leu Arg Ile Arg Ala Gln Gly Ser Val Asp Ser Pro Gly Asp
260 265 270

Glu Met Pro Arg Lys Leu Asp Ala Trp Glu Ile Ala Lys Phe His Leu
275 280 285

Ala Ala Thr Gln Gln Ala Arg Val Asp Leu Leu Glu Ala Ala Phe Ala
290 295 300

Leu Asp Tyr Ala Ala Leu Arg Asp Val Arg Val Tyr Gly Asp Tyr Arg
305 310 315 320

Asn Ala Leu Ala Leu Arg Phe Ile Lys Arg Glu Ala Leu Arg Leu Leu
325 330 335

Gly Ala Arg Arg Gly Asn Ala Ser Thr Met Pro Ala Val Ala Ala Gly
340 345 350

Glu Tyr Asp Glu Ile Val Ala Ser Gly Ala Ala Asn Asp Ala Ala Tyr
355 360 365

Val Ser Met Ala Ala Ala Leu Ile Ala Gly Val Leu Cys Asp Leu Glu
370 375 380

Ser Ala Gln Arg Thr Leu Pro Val Val Leu Ala Arg Phe Arg Pro Leu
385 390 395 400

Gly Val Leu Ala Arg Phe Arg Arg Leu Glu Gln Glu Thr Ala Gly Met
405 410 415

Leu Leu Gly Asp Gln Glu Pro Glu Pro Arg Gly Phe Ile Ser Phe Thr
420 425 430

Asp Phe Arg Asp Ser Asp Ala Phe Ala Ser Tyr Ala Glu Tyr Ala Ala
435 440 445

Gln Phe Asn Asp Tyr Ile Asp Gln Tyr Ser Ile Leu Glu Ala Gln Arg
450 455 460

Leu Ala Arg Ile Leu Ala Leu Gly Ser Arg Met Thr Val Asp Gln Trp
465 470 475 480

Cys Leu Pro Leu Gln Lys Val Arg His Tyr Lys Val Leu Thr Ser Gln
485 490 495

Pro Gly Leu Ile Ala Arg Gly Ile Glu Asn His Asn Arg Gly Ile Glu
500 505 510

Tyr Cys Leu Gly Arg Pro Pro Leu Thr Asp Leu Pro Gly Leu Phe Thr
515 520 525

Met Phe Gln Leu His Asp Ser Ser Trp Leu Leu Val Ser Asn Ile Asn
530 535 540

Gly Glu Leu Trp Ser Asp Val Leu Ala Asn Ala Glu Val Met Gln Asn
545 550 555 560

Pro Thr Leu Ala Ala Leu Ala Glu Pro Gln Gly Arg Phe Arg Thr Gly
565 570 575

Arg Arg Thr Gly Gly Trp Phe Leu Gly Gly Pro Ala Thr Glu Gly Pro
580 585 590

Ser Leu Arg Asp Asn Tyr Leu Leu Lys Leu Arg Gln Ser Asn Pro Gly
595 600 605

Leu Asp Val Lys Lys Cys Trp Tyr Phe Gly Tyr Arg Gln Glu Tyr Arg
610 615 620

Leu Pro Ala Gly Ala Leu Gly Val Pro Leu Phe Ala Val Ser Val Ala
625 630 635 640

Leu Arg His Ser Leu Asp Asp Leu Ala Ala His Ala Lys Ser Ala Leu
645 650 655

Tyr Lys Pro Ser Glu Trp Gln Lys Phe Ala Phe Trp Ile Val Pro Phe
660 665 670

Tyr Arg Glu Ile Phe Phe Ser Thr Gln Asp Arg Ser Tyr Arg Val Asp
675 680 685

Val Gly Ser Ile Val Phe Asp Ser Ile Ser Leu Leu Ala Ser Val Phe
690 695 700

Ser Ile Gly Gly Lys Leu Gly Ser Phe Thr Arg Thr Gln Tyr Gly Asn
705 710 715 720

Leu Arg Asn Phe Val Val Arg Gln Arg Ile Ala Gly Leu Ser Gly Gln
725 730 735

Arg Leu Trp Arg Ser Val Leu Lys Glu Leu Pro Ala Leu Ile Gly Ala
740 745 750

Ser Gly Leu Arg Leu Ser Arg Ser Leu Leu Val Asp Leu Tyr Glu Ile
755 760 765

Phe Glu Pro Val Pro Ile Arg Arg Leu Val Ala Gly Phe Val Ser Ala
770 775 780

Thr Thr Val Gly Gly Arg Asn Gln Ala Phe Leu Arg Gln Ala Phe Ser
785 790 795 800

Ala Ala Ser Ser Ser Ala Gly Arg Thr Gly Gly Gln Leu Ala Ser Glu
805 810 815

Trp Arg Met Ala Gly Val Asp Ala Thr Gly Leu Val Glu Ser Thr Ser
820 825 830

Gly Gly Arg Phe Glu Gly Ile Tyr Thr Arg Gly Leu Gly Pro Leu Ser
835 840 845

Glu Cys Thr Glu His Phe Ile Val Glu Ser Gly Asn Ala Tyr Arg Val
850 855 860

Ile Trp Asp Ala Tyr Thr His Gly Trp Arg Val Val Asn Gly Arg Leu
865 870 875 880

Pro Pro Arg Leu Thr Tyr Thr Val Pro Val Arg Leu Asn Gly Gln Gly
885 890 895

His Trp Glu Thr His Leu Asp Val Pro Gly Arg Gly Gly Ala Pro Glu
900 905 910

Ile Phe Gly Arg Ile Arg Thr Arg Asn Leu Val Ala Leu Ala Ala Glu
915 920 925

Gln Ala Ala Pro Met Arg Arg Leu Leu Asn Gln Ala Arg Arg Val Ala
930 935 940

Leu Arg His Ile Asp Thr Cys Arg Ser Arg Leu Ala Leu Pro Arg Ala
945 950 955 960

Glu Ser Asp Met Asp Ala Ala Ile Arg Ile Phe Phe Gly Glu Pro Asp
965 970 975

Ala Gly Leu Arg Gln Arg Ile Gly Arg Arg Leu Gln Glu Val Arg Ala
980 985 990

Tyr Ile Gly Asp Leu Ser Pro Val Asn Asp Val Leu Tyr Arg Ala Gly
995 1000 1005

Tyr Asp Leu Asp Asp Val Ala Thr Leu Phe Asn Ala Val Asp Arg
1010 1015 1020

Asn Thr Ser Leu Gly Arg Gln Ala Arg Met Glu Leu Tyr Leu Asp
1025 1030 1035

Ala Ile Val Asp Leu His Ala Arg Leu Gly Tyr Glu Asn Ala Arg
1040 1045 1050

Phe Val Asp Leu Met Ala Phe His Leu Leu Ser Leu Gly His Ala
1055 1060 1065

Ala Thr Ala Ser Glu Val Val Glu Ala Val Ser Pro Arg Leu Leu
1070 1075 1080

Gly Asn Val Phe Asp Ile Ser Asn Val Ala Gln Leu Glu Arg Gly
1085 1090 1095

Ile Gly Asn Pro Ala Ser Thr Gly Leu Phe Val Met Leu Gly Ala
1100 1105 1110

Tyr Ser Glu Ser Ser Pro Ala Ile Phe Gln Ser Phe Val Asn Asp
1115 1120 1125

Ile Phe Pro Ala Trp Arg Gln Ala Ser Gly Gly Pro Leu Val
1130 1135 1140

Trp Asn Phe Gly Pro Ala Ala Ile Ser Pro Thr Arg Leu Asp Tyr

1145 1150 1155

Ala Asn Thr Asp Ile Gly Leu Leu Asn His Gly Asp Ile Ser Pro
1160 1165 1170

Leu Arg Ala Arg Pro Pro Leu Gly Gly Arg Arg Asp Ile Asp Leu
1175 1180 1185

Pro Pro Gly Leu Asp Ile Ser Phe Val Arg Tyr Asp Arg Pro Val
1190 1195 1200

Arg Met Ser Ala Pro Arg Ala Leu Asp Ala Ser Val Phe Arg Pro
1205 1210 1215

Val Asp Gly Pro Val His Gly Tyr Ile Gln Ser Trp Thr Gly Ala
1220 1225 1230

Glu Ile Glu Tyr Ala Tyr Gly Ala Pro Ala Ala Ala Arg Glu Val
1235 1240 1245

Met Leu Thr Asp Asn Val Arg Ile Ile Ser Ile Glu Asn Gly Asp
1250 1255 1260

Glu Gly Ala Ile Gly Val Arg Val Arg Leu Asp Thr Val Pro Val
1265 1270 1275

Ala Thr Pro Leu Ile Leu Thr Gly Gly Ser Leu Ser Gly Cys Thr
1280 1285 1290

Thr Met Val Gly Val Lys Glu Gly Tyr Leu Ala Phe Tyr His Thr
1295 1300 1305

Gly Lys Ser Thr Glu Leu Gly Asp Trp Ala Thr Ala Arg Glu Gly
1310 1315 1320

Val Gln Ala Leu Tyr Gln Ala His Leu Ala Met Gly Tyr Ala Pro
1325 1330 1335

Ile Ser Ile Pro Ala Pro Met Arg Asn Asp Asp Leu Val Ser Ile
1340 1345 1350

Ala Ala Thr Tyr Asp Arg Ala Val Ile Ala Tyr Leu Gly Lys Asp
1355 1360 1365

Val Pro Gly Gly Ser Thr Arg Ile Thr Arg His Asp Glu Gly
1370 1375 1380

Ala Gly Ser Val Val Ser Phe Asp Tyr Asn Ala Ala Val Gln Ala
1385 1390 1395

Ser Ala Val Pro Arg Leu Gly Gln Val Tyr Val Leu Ile Ser Asn
1400 1405 1410

Asp Gly Gln Gly Ala Arg Ala Val Leu Leu Ala Glu Asp Leu Ala
1415 1420 1425

Trp Ala Gly Ser Gly Ser Ala Leu Asp Val Leu Asn Glu Arg Leu
1430 1435 1440

Val Thr Leu Phe Pro Ala Pro Val
1445 1450

<210> 5

<211> 240

<212> PRT

<213> *Salmonella typhimurium*

<400> 5

Met Thr Lys Ile Thr Leu Ser Pro Gln Asn Phe Arg Ile Gln Lys Gln
1 5 10 15

Glu Thr Thr Leu Leu Lys Glu Lys Ser Thr Glu Lys Asn Ser Leu Ala
20 25 30

Lys Ser Ile Leu Ala Val Lys Asn His Phe Ile Glu Leu Arg Ser Lys
35 40 45

Leu Ser Glu Arg Phe Ile Ser His Lys Asn Thr Glu Ser Ser Ala Thr
50 55 60

His Phe His Arg Gly Ser Ala Ser Glu Gly Arg Ala Val Leu Thr Asn
65 70 75 80

Lys Val Val Lys Asp Phe Met Leu Gln Thr Leu Asn Asp Ile Asp Ile
85 90 95

Arg Gly Ser Ala Ser Lys Asp Pro Ala Tyr Ala Ser Gln Thr Arg Glu
100 105 110

Ala Ile Leu Ser Ala Val Tyr Ser Lys Asn Lys Asp Gln Cys Cys Asn
115 120 125

Leu Leu Ile Ser Lys Gly Ile Asn Ile Ala Pro Phe Leu Gln Glu Ile
130 135 140

Gly Glu Ala Ala Lys Asn Ala Gly Leu Pro Gly Thr Thr Lys Asn Asp
145 150 155 160

Val Phe Thr Pro Ser Gly Ala Gly Ala Asn Pro Phe Ile Thr Pro Leu
165 170 175

Ile Ser Ser Ala Asn Ser Lys Tyr Pro Arg Met Phe Ile Asn Gln His
180 185 190

Gln Gln Ala Ser Phe Lys Ile Tyr Ala Glu Lys Ile Ile Met Thr Glu
195 200 205

Val Ala Pro Leu Phe Asn Glu Cys Ala Met Pro Thr Pro Gln Gln Phe
210 215 220

Gln Leu Ile Leu Glu Asn Ile Ala Asn Lys Tyr Ile Gln Tyr Thr Pro
225 230 235 240

<210> 6
<211> 240
<212> PRT
<213> *Salmonella typhimurium*

<400> 6

Met Thr Asn Ile Thr Leu Ser Thr Gln His Tyr Arg Ile His Arg Ser
1 5 10 15

Asp Val Glu Pro Val Lys Glu Lys Thr Thr Glu Lys Asp Ile Phe Ala
20 25 30

Lys Ser Ile Thr Ala Val Arg Asn Ser Phe Ile Ser Leu Ser Thr Ser
35 40 45

Leu Ser Asp Arg Phe Ser Leu His Gln Gln Thr Asp Ile Pro Thr Thr
50 55 60

His Phe His Arg Gly Asn Ala Ser Glu Gly Arg Ala Val Leu Thr Ser
65 70 75 80

Lys Thr Val Lys Asp Phe Met Leu Gln Lys Leu Asn Ser Leu Asp Ile
85 90 95

Lys Gly Asn Ala Ser Lys Asp Pro Ala Tyr Ala Arg Gln Thr Cys Glu
100 105 110

Ala Ile Leu Ser Ala Val Tyr Ser Asn Asn Lys Asp Gln Cys Cys Lys
115 120 125

Leu Leu Ile Ser Lys Gly Val Ser Ile Thr Pro Phe Leu Lys Glu Ile
130 135 140

Gly Glu Ala Ala Gln Asn Ala Gly Leu Pro Gly Glu Ile Lys Asn Gly
145 150 155 160

Val Phe Thr Pro Gly Gly Ala Gly Ala Asn Pro Phe Val Val Pro Leu
165 170 175

Ile Ala Ser Ala Ser Ile Lys Tyr Pro His Met Phe Ile Asn His Asn
180 185 190

Gln Gln Val Ser Phe Lys Ala Tyr Ala Glu Lys Ile Val Met Lys Glu
195 200 205

Val Thr Pro Leu Phe Asn Lys Gly Thr Met Pro Thr Pro Gln Gln Phe
210 215 220

Gln Leu Thr Ile Glu Asn Ile Ala Asn Lys Tyr Leu Gln Asn Ala Ser
225 230 235 240

<210> 7
<211> 166
<212> PRT
<213> *Shigella flexneri*

<400> 7
Met Glu Ile Gln Asn Thr Lys Ser Ala Pro Ile Leu Tyr Thr Asp Ile
1 5 10 15

Ser Thr Lys Gln Thr Gln Ser Ser Ser Glu Thr Gln Lys Ser Gln Asn
20 25 30

Tyr Gln Gln Leu Ala Ala His Ile Pro Leu Asn Val Gly Lys Asn Pro
35 40 45

Val Leu Thr Thr Thr Leu Asn Asp Asp Gln Leu Leu Lys Leu Ser Glu
50 55 60

Gln Val Gln His Asp Ser Glu Ile Ile Ala Arg Leu Thr Asp Lys Lys
65 70 75 80

Met Lys Asp Leu Ser Glu Met Ser His Thr Ile Thr Pro Glu Asn Thr
85 90 95

Leu Asp Ile Ser Ser Leu Ser Ser Asn Ala Val Ser Leu Ile Ile Ser
100 105 110

Val Ala Val Leu Leu Ser Ala Leu Arg Thr Ala Glu Thr Arg Leu Gly
115 120 125

Ser Gln Leu Ser Leu Ile Ala Phe Asp Ala Thr Lys Ser Ala Ala Glu
130 135 140

Asn Ile Val Arg Gln Gly Leu Ala Ala Leu Ser Ser Ser Ile Thr Gly
145 150 155 160

Ala Val Thr Gln Val Gly
165

<210> 8
<211> 1186
<212> PRT
<213> Helicobacter pylori

<400> 8

Met Thr Asn Glu Thr Ile Asp Gln Thr Arg Thr Pro Asp Gln Thr Gln
1 5 10 15

Ser Gln Thr Ala Phe Asp Pro Gln Gln Phe Ile Asn Asn Leu Gln Val
20 25 30

Ala Phe Ile Lys Val Asp Asn Val Val Ala Ser Phe Asp Pro Asp Gln
35 40 45

Lys Pro Ile Val Asp Lys Asn Asp Arg Asp Asn Arg Gln Ala Phe Asp
50 55 60

Gly Ile Ser Gln Leu Arg Glu Glu Tyr Ser Asn Lys Ala Ile Lys Asn
65 70 75 80

Pro Thr Lys Lys Asn Gln Tyr Phe Ser Asp Phe Ile Asp Lys Ser Asn
85 90 95

Asp Leu Ile Asn Lys Asp Asn Leu Ile Asp Val Glu Ser Ser Thr Lys
100 105 110

Ser Phe Gln Lys Phe Gly Asp Gln Arg Tyr Gln Ile Phe Thr Ser Trp
115 120 125

Val Ser His Gln Lys Asp Pro Ser Lys Ile Asn Thr Arg Ser Ile Arg
130 135 140

Asn Phe Met Glu Asn Ile Ile Gln Pro Pro Ile Pro Asp Asp Lys Glu
145 150 155 160

Lys Ala Glu Phe Leu Lys Ser Ala Lys Gln Ser Phe Ala Gly Ile Ile
165 170 175

Ile Gly Asn Gln Ile Arg Thr Asp Gln Lys Phe Met Gly Val Phe Asp
180 185 190

Glu Ser Leu Lys Glu Arg Gln Glu Ala Glu Lys Asn Gly Gly Pro Thr
195 200 205

Gly Gly Asp Trp Leu Asp Ile Phe Leu Ser Phe Ile Phe Asn Lys Lys
210 215 220

Gln Ser Ser Asp Val Lys Glu Ala Ile Asn Gln Glu Pro Val Pro His
225 230 235 240

Val Gln Pro Asp Ile Ala Thr Thr Thr Asp Ile Gln Gly Leu Pro
245 250 255

Pro Glu Ala Arg Asp Leu Leu Asp Glu Arg Gly Asn Phe Ser Lys Phe
260 265 270

Thr Leu Gly Asp Met Glu Met Leu Asp Val Glu Gly Val Ala Asp Ile
275 280 285

Asp Pro Asn Tyr Lys Phe Asn Gln Leu Ile His Asn Asn Ala Leu
290 295 300

Ser Ser Val Leu Met Gly Ser His Asn Gly Ile Glu Pro Glu Lys Val
305 310 315 320

Ser Leu Leu Tyr Ala Gly Asn Gly Phe Gly Asp Lys His Asp Trp
325 330 335

Asn Ala Thr Val Gly Tyr Lys Asp Gln Gln Gly Asn Asn Val Ala Thr
340 345 350

Leu Ile Asn Val His Met Lys Asn Gly Ser Gly Leu Val Ile Ala Gly
355 360 365

Gly Glu Lys Gly Ile Asn Asn Pro Ser Phe Tyr Leu Tyr Lys Glu Asp
370 375 380

Gln Leu Thr Gly Ser Gln Arg Ala Leu Ser Gln Glu Glu Ile Arg Asn
385 390 395 400

Lys Val Asp Phe Met Glu Phe Leu Ala Gln Asn Asn Thr Lys Leu Asp
405 410 415

Asn Leu Ser Glu Lys Glu Lys Phe Gln Asn Glu Ile Glu Asp
420 425 430

Phe Gln Lys Asp Ser Lys Ala Tyr Leu Asp Ala Leu Gly Asn Asp Arg
435 440 445

Ile Ala Phe Val Ser Lys Lys Asp Thr Lys His Ser Ala Leu Ile Thr
450 455 460

Glu Phe Asn Asn Gly Asp Leu Ser Tyr Thr Leu Lys Asp Tyr Gly Lys
465 470 475 480

Lys Ala Asp Lys Ala Leu Asp Arg Glu Lys Asn Val Thr Leu Gln Gly
485 490 495

Ser Leu Lys His Asp Gly Val Met Phe Val Asp Tyr Ser Asn Phe Lys
500 505 510

Tyr Thr Asn Ala Ser Lys Asn Pro Asn Lys Gly Val Gly Ala Thr Asn
515 520 525

Gly Val Ser His Leu Glu Ala Gly Phe Asn Lys Val Ala Val Phe Asn
530 535 540

Leu Pro Asp Leu Asn Asn Leu Ala Ile Thr Ser Phe Val Arg Arg Asn
545 550 555 560

Leu Glu Asn Lys Leu Thr Ala Lys Gly Leu Ser Leu Gln Glu Ala Asn
565 570 575

Lys Leu Ile Lys Asp Phe Leu Ser Ser Asn Lys Glu Leu Ala Gly Lys
580 585 590

Ala Leu Asn Phe Asn Lys Ala Val Ala Glu Ala Lys Ser Thr Gly Asn
595 600 605

Tyr Asp Glu Val Lys Lys Ala Gln Lys Asp Leu Glu Lys Ser Leu Arg
610 615 620

Lys Arg Glu His Leu Glu Lys Glu Val Glu Lys Lys Leu Glu Ser Lys
625 630 635 640

Ser Gly Asn Lys Asn Lys Met Glu Ala Lys Ala Gln Ala Asn Ser Gln
645 650 655

Lys Asp Glu Ile Phe Ala Leu Ile Asn Lys Glu Ala Asn Arg Asp Ala
660 665 670

Arg Ala Ile Ala Tyr Thr Gln Asn Leu Lys Gly Ile Lys Arg Glu Leu
675 680 685

Ser Asp Lys Leu Glu Lys Ile Ser Lys Asp Leu Lys Asp Phe Ser Lys
690 695 700

Ser Phe Asp Glu Phe Lys Asn Gly Lys Asn Lys Asp Phe Ser Lys Ala
705 710 715 720

Glu Glu Thr Leu Lys Ala Leu Lys Gly Ser Val Lys Asp Leu Gly Ile
725 730 735

Asn Pro Glu Trp Ile Ser Lys Val Glu Asn Leu Asn Ala Ala Leu Asn
740 745 750

Glu Phe Lys Asn Gly Lys Asn Lys Asp Phe Ser Lys Val Thr Gln Ala
755 760 765

Lys Ser Asp Leu Glu Asn Ser Val Lys Asp Val Ile Ile Asn Gln Lys
770 775 780

Val Thr Asp Lys Val Asp Asn Leu Asn Gln Ala Val Ser Val Ala Lys
785 790 795 800

Ala Met Gly Asp Phe Ser Arg Val Glu Gln Val Leu Ala Asp Leu Lys
805 810 815

Asn Phe Ser Lys Glu Gln Leu Ala Gln Ala Gln Lys Asn Glu Asp
820 825 830

Phe Asn Thr Gly Lys Asn Ser Glu Leu Tyr Gln Ser Val Lys Asn Ser
835 840 845

Val Asn Lys Thr Leu Val Gly Asn Gly Leu Ser Gly Ile Glu Ala Thr

850 855 860

Ala Leu Ala Lys Asn Phe Ser Asp Ile Lys Lys Glu Leu Asn Glu Lys
865 870 875 880

Phe Lys Asn Phe Asn Asn Asn Asn Gly Leu Lys Asn Ser Thr Glu
885 890 895

Pro Ile Tyr Ala Lys Val Asn Lys Lys Lys Thr Gly Gln Val Ala Ser
900 905 910

Pro Glu Glu Pro Ile Tyr Thr Gln Val Ala Lys Lys Val Asn Ala Lys
915 920 925

Ile Asp Arg Leu Asn Gln Ile Ala Ser Gly Leu Gly Gly Val Gly Gln
930 935 940

Ala Ala Gly Phe Pro Leu Lys Arg His Asp Lys Val Asp Asp Leu Ser
945 950 955 960

Lys Val Gly Leu Ser Ala Ser Pro Glu Pro Ile Tyr Ala Thr Ile Asp
965 970 975

Asp Leu Gly Gly Pro Phe Pro Leu Lys Arg His Asp Lys Val Asp Asp
980 985 990

Leu Ser Lys Val Gly Arg Ser Arg Asn Gln Glu Leu Ala Gln Lys Ile
995 1000 1005

Asp Asn Leu Asn Gln Ala Val Ser Glu Ala Lys Ala Gly Phe Phe
1010 1015 1020

Gly Asn Leu Glu Gln Thr Ile Asp Lys Leu Lys Asp Ser Thr Lys
1025 1030 1035

Lys Asn Val Met Asn Leu Tyr Val Glu Ser Ala Lys Lys Val Pro
1040 1045 1050

Ala Ser Leu Ser Ala Lys Leu Asp Asn Tyr Ala Ile Asn Ser His
1055 1060 1065

Thr Arg Ile Asn Ser Asn Ile Gln Asn Gly Ala Ile Asn Glu Lys
1070 1075 1080

Ala Thr Gly Met Leu Thr Gln Lys Asn Pro Glu Trp Leu Lys Leu
1085 1090 1095

Val Asn Asp Lys Ile Val Ala His Asn Val Gly Ser Val Ser Leu
1100 1105 1110

Ser Glu Tyr Asp Lys Ile Gly Phe Asn Gln Lys Asn Met Lys Asp
1115 1120 1125

Tyr Ser Asp Ser Phe Lys Phe Ser Thr Lys Leu Asn Asn Ala Val
1130 1135 1140

Lys Asp Ile Lys Ser Gly Phe Thr His Phe Leu Ala Asn Ala Phe
1145 1150 1155

Ser Thr Gly Tyr Tyr Cys Leu Ala Arg Glu Asn Ala Glu His Gly
1160 1165 1170

Ile Lys Asn Val Asn Thr Lys Gly Gly Phe Gln Lys Ser
1175 1180 1185

<210> 9
<211> 201
<212> PRT
<213> Homo sapiens

<400> 9

Ser Ser Gly Pro Ser Ser Ser Leu Asp Asn Gly Asn Ser Leu Asp Val
1 5 10 15

Leu Lys Asn His Val Leu Asn Glu Leu Ile Gln Thr Glu Arg Val Tyr
20 25 30

Val Arg Glu Leu Tyr Thr Val Leu Leu Gly Tyr Arg Ala Glu Met Asp
35 40 45

Asn Pro Glu Met Phe Asp Leu Met Pro Pro Leu Leu Arg Asn Lys Lys
50 55 60

Asp Ile Leu Phe Gly Asn Met Ala Glu Ile Tyr Glu Phe His Asn Asp
65 70 75 80

Ile Phe Leu Ser Ser Leu Glu Asn Cys Ala His Ala Pro Glu Arg Val
85 90 95

Gly Pro Cys Phe Leu Glu Arg Lys Asp Asp Phe Gln Met Tyr Ala Lys
100 105 110

Tyr Cys Gln Asn Lys Pro Arg Ser Glu Thr Ile Trp Arg Lys Tyr Ser
115 120 125

Glu Cys Ala Phe Phe Gln Glu Cys Gln Arg Lys Leu Lys His Arg Leu
130 135 140

Arg Leu Asp Ser Tyr Leu Leu Lys Pro Val Gln Arg Ile Thr Lys Tyr
145 150 155 160

Gln Leu Leu Leu Lys Glu Leu Leu Lys Tyr Ser Lys Asp Cys Glu Gly
165 170 175

Ser Ala Leu Leu Lys Lys Ala Leu Asp Ala Met Leu Asp Leu Leu Lys
180 185 190

Ser Val Asn Asp Ser Met His Gln Ile
195 200